

In the Claims:

1-23. Cancelled.

24. (Currently Amended) A method of inducing organized, functional bone formation at a site of bone infirmity in a human, comprising the steps of:

- (a) transforming a cultured mesenchymal stem cell with a DNA encoding bone morphogenesis protein 2 (BMP-2);
- (b) culturing the cultured mesenchymal stem cell transformed in step (a), under conditions enabling expression of said DNA encoding bone morphogenesis protein 2; and
- (c) implanting said cultured mesenchymal stem cell at a site of bone infirmity

whereby autocrine and paracrine effects of expressed bone morphogenesis protein 2 at said site of bone infirmity result in organized, functional bone formation, thereby inducing functional bone formation at a site of bone infirmity.

25. (Currently Amended) The method of claim 24[[3]], wherein said mesenchymal stem cell is a primary cell.

26. (Currently Amended) The method of claim 24[[3]], wherein said mesenchymal stem cell is a cultured cell line.

27. (Currently Amended) The method of claim 24[[3]], wherein said mesenchymal stem cell expresses an endogenous bone morphogenesis protein receptor.